1. Will you speak about why the High-Dose inactivated vaccine this year is only 3 strains and not 4?

Fluzone® High-Dose, a high-dose inactivated influenza vaccine (HD-IIV3) was licensed in 2009, when all influenza vaccines were trivalent. CDC will ask the manufacturer if they have plans to add a second B strain to make this vaccine quadrivalent.

1. What makes it [Fluzone® High-Dose] high dose?

Standard-dose inactivated influenza vaccines contain 15 micrograms (mcg) of the influenza virus protein hemagglutinin (HA) for each virus strain in the vaccine. The high-dose inactivated influenza vaccine contains 60 mcg of each vaccine virus’ HA, or four times that contained in the standard-dose vaccine.

1. Is the 65+ Influenza vaccine a quadrivalent or trivalent vaccine?

There are two influenza vaccines licensed only for persons 65 years and older: Fluzone High-Dose® (HD-IIV3) and FLUAD® (an adjuvanted inactivated influenza vaccine, aIIV3). Both are trivalent vaccines.

1. If you were older than 65 and your workplace administers IIV4, but you could request HDIIV3, which one would you get?

The decision which vaccine one receives would be made by the workplace and the employee, as well as depend on which vaccines are available to the workplace. One assumes the employee could seek out the high-dose vaccine elsewhere if the employer could not provide it.

1. [Does CDC express] any preference between Fluzone High dose and Fluad for people 65 and older?

To date, there are no published data comparing these two vaccines’ effectiveness. CDC and ACIP express no preference as to which vaccine persons 65 years and older receive. CDC urges all persons 6 months and older to receive an age-appropriate, current seasonal influenza vaccine annually. There are also other influenza vaccines which are also appropriate options for people who are aged 65 years and older, including the standard-dose unadjuvated influenza vaccine (IIV) and the recombinant influenza vaccine (RIV4). The intranasally-administered live attenuated influenza vaccine (LAIV4) is not licensed for people aged 65 years and older.

1. Will the CDC make a [preferential] recommendation in regards to high dose influenza vaccine?

Neither CDC nor the Advisory Committee on Immunization Practices (ACIP) has issued a preference for any particular influenza vaccine where there is more than one that is appropriate and available. All recipients should receive an age- appropriate vaccine For people aged 65 years and older, the high-dose inactivated, adjuvanted inactivated, unadjuvanted standard-dose inactivated, and recombinant vaccines are all acceptable options for the 2018-19 influenza season.

1. Why do manufacturers publish (before ACIP recommendations) vaccine package inserts with directions of how to administer dosages to patients when the CDC and ACIP recommendations are not published until late August?

Manufacturers have timelines to meet for the Food and Drug Administration (FDA) for annual licensure of their influenza vaccines. These timelines vary and may not coincide with publication of the CDC and ACIP annual influenza vaccine recommendations.

1. If IIV is given subcutaneously in error, is it still valid? Does it need to be repeated?

Vaccines given in a site or manner other than that for which they are licensed generally should be considered invalid, and the dose should be repeated as soon as possible. Should such an administration error occur, the vaccinator may check with the vaccine manufacturer to learn if there are data supporting the effectiveness of an alternate route of vaccine administration, and possibly avoid repeat vaccination. More information about non-standard vaccination practices is at <https://www.cdc.gov/vaccines/hcp/acip-recs/general-recs/administration.html>.

1. For people 50 and older should we consider giving Flublok based on the superiority data published in the New England Journal of Medicine compared to standard dose flu vaccine in this population? Especially for those with underlying medical conditions at risk for severe flu complications?

The manuscript referred to is at <https://www.nejm.org/doi/10.1056/NEJMoa1608862?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%3dwww.ncbi.nlm.nih.gov>. In this randomized trial, Flublok Quadrivalent (recombinant influenza vaccine, RIV4) was more efficacious than IIV4 among people aged 50 years and older. High-dose inactivated vaccine (HD-IIV3) and adjuvanted inactivated vaccine (aIIV3) each have also been compared with standard dose inactivated vaccines, among people aged 65 years and older. Fluzone High-Dose (HD-IIV3) was more efficacious than standard-dose IIV3 in a large randomized trial (<https://www.ncbi.nlm.nih.gov/pubmed/25119609>); Fluad (aIIV3) was more effective than IIV3 in a smaller observational study (<https://www.ncbi.nlm.nih.gov/pubmed/23933368>). However, there have been no trials comparing HD-IIV3, aIIV3, and RIV4 against one another. Neither CDC nor ACIP has expressed a preference for either type of vaccine in any population.

1. Why are trivalent vaccines still available? What would be the reason to use them if quadrivalent is available?

At this time, the only standard-dose trivalent inactivated vaccine available in the United States is Afluria (see Table 1 at <https://www.cdc.gov/mmwr/volumes/67/rr/pdfs/rr6703a1-H.pdf>). Cross-lineage protection is variable, and may be better in some seasons than others. Theoretically, quadrivalent vaccine is a better choice to be more certain of protection against both lineages of influenza B viruses.

1. Does this 2018/19 vaccine protect against the same strains as last year or different?

There are two new strains of influenza viruses represented in the 2018-19 seasonal influenza vaccines in the United States which were not present in the 2017-18 vaccine: an A/Singapore/INFIMH-16-0019/2016 (H3N2)-like virus, and a B/Colorado/06/2017–like virus (Victoria lineage).

1. A 6 y/o child received 1 flu vaccine in 2017, would they need one or two flu vaccines [in 2018-19?] Is there a time frame from when the first flu vaccine was given to determine a second flu vaccine?

The CDC and ACIP recommendations state:

“Children aged 6 months through 8 years who have previously received ≥2 total doses of trivalent or quadrivalent influenza vaccine at least 4 weeks apart before July 1, 2018, require only one dose for 2018–19. The 2 doses of influenza vaccine do not have to have been administered in the same season or consecutive seasons. Children in this age group who have not previously received ≥2 doses of trivalent or quadrivalent influenza vaccine before July 1, 2018 require 2 doses for the 2018–19 season. The interval between the 2 doses should be at least 4 weeks ([Figure](https://www.cdc.gov/mmwr/volumes/67/rr/rr6703a1.htm#F1_down)).”

1. How long does the flu virus live on surfaces?

Influenza viruses can survive and be infectious on some surfaces for up to 48 hours, though often for less time. See <https://www.cdc.gov/immigrantrefugeehealth/pdf/seasonal-flu/contamination_cleaning_english_508.pdf>.

1. Did you say that the intradermal vaccine is not available this year?

CDC was informed by the manufacturer of this vaccine it would not be available for the 2018-19 season.

1. Do Influenza Vaccine containing antigens changes every year by production companies based on the current endemic circulation?

Influenza vaccine virus selection is a twice yearly process, with formulations recommended each February for the Northern Hemisphere, and usually in September for the Southern Hemisphere. Selection is based on assessment of influenza virus surveillance from around the world. More details on the process of vaccine virus selection are available at <https://www.cdc.gov/flu/about/season/vaccine-selection.htm>. In most seasons, there is a change to at least one virus in the vaccine.

1. One of my employees has history (hx) of Guillain Barre Syndrome (GBS) when he was child. He doesn't remember why. Can he get [a] flu shot?

The employee should consult with his physician about his risk of GBS following vaccination, which is deemed very small, and risk of complications of influenza disease if not vaccinated.

CDC’s background material to the 2018-19 recommendations state (at <https://www.cdc.gov/flu/professionals/acip/2018-2019/background/safety-vaccines.htm>): “Persons with a history of GBS have a substantially greater likelihood of subsequently experiencing GBS than persons without such a history (424). Thus, the likelihood of coincidentally experiencing GBS after influenza vaccination is expected to be greater among persons with a history of GBS than among persons with no history of this syndrome. Whether influenza vaccination specifically might increase the risk for recurrence of GBS is unknown. Among 311 patients with GBS who responded to a survey, 11 (4%) reported some worsening of symptoms after influenza vaccination; however, some of these patients had received other vaccines at the same time, and recurring symptoms were generally mild (447). In a Kaiser Permanente Northern California database study among >3 million members conducted over an 11-year period, no cases of recurrent GBS were identified after influenza vaccination in 107 persons with a documented prior diagnosis of GBS, two of whom had initially developed GBS within 6 weeks of influenza vaccination (448).”

1. Does ACIP recommend that the older population get the vaccine later in the season since their immunity is more likely to wane sooner? Why does our immunity wane so quickly?

CDC recommendations state: “A number of observational studies (14–21) and a post hoc analysis from a randomized controlled trial (22) have reported decreases in vaccine effectiveness (VE) within a single influenza season, with increasing time postvaccination. Waning effects have not been observed consistently across age groups, virus subtypes, and seasons; and observed declines in protection could be at least in part attributable to bias, unmeasured confounding, or the late season emergence of antigenic drift variants that are less well-matched to the vaccine strain. Some studies suggest this occurs to a greater degree with A(H3N2) viruses than with A(H1N1) or B viruses (19,21). This effect might also vary with recipient age; in some studies waning was more pronounced among older adults (14,15) and younger children (15). Rates of decline in VE have also varied. A multiseason (2011–12 through 2014–15) analysis from the U.S. Influenza Vaccine Effectiveness (U.S. Flu VE) Network found that VE declined by about 7% per month for H3N2 and influenza B, and 6%–11% per month for H1N1pdm09 (16). VE remained greater than zero for at least 5 to 6 months after vaccination. An analysis from the 2011–12 through 2013–14 seasons noted protection ranging from 54% to 67% during days 0 through 180 postvaccination (20). A third multi-season analysis (2011–12 through 2014–15) conducted in Europe noted a decline in VE to 0% at 111 days postvaccination for A(H3N2) viruses. VE against B viruses declined more slowly and VE against A(H1N1) viruses remained roughly stable at 50-55% through the influenza season (21)….

Although delaying vaccination might result in greater immunity later in the season, deferral also might result in missed opportunities to vaccinate, as well as difficulties in vaccinating a population within a more constrained time period. Efforts should be structured to optimize vaccination coverage before influenza activity in the community begins….

Community vaccination programs should balance maximizing likelihood of persistence of vaccine-induced protection through the season with avoiding missed opportunities to vaccinate or vaccinating after onset of influenza circulation occurs. Revaccination later in the season of persons who have already been fully vaccinated is not recommended. Vaccination should continue to be offered as long as influenza viruses are circulating and unexpired vaccine is available. To avoid missed opportunities for vaccination, providers should offer vaccination during routine health care visits and hospitalizations.”

More information is at <https://www.cdc.gov/mmwr/volumes/67/rr/rr6703a1.htm>.

1. I have heard of some providers giving a 1/2 dose followed by a second 1/2 dose 1-2 weeks later for individuals who have sensitivity to prior vaccines. Would you recommend this?

Influenza vaccines should be administered as licensed, using the recommended dose and route. CDC and ACIP have no recommendation to use half doses of the vaccine. If patients describe reactions that may have been anaphylaxis or other adverse events of concern following previous influenza vaccination, they should be evaluated to assess the previous reaction(s), if possible, by an allergist or immunologist. Previous severe allergic reaction to the vaccine or any of its components is a contraindication to future receipt of the vaccine.

1. My dissertation was conducted on barriers to nursing faculty receiving influenza vaccine a common theme was the comment that "I received the vaccine but got flu anyway" Any counseling tips for healthcare workers who are reluctant to receive the vaccine?

Many groups have developed materials and strategies to promote influenza vaccination for health care personnel. One good set of tools is CDC’s long term care personnel tool kit, most of which is relevant to health care personnel in all settings; see <https://www.cdc.gov/flu/toolkit/long-term-care/strategies.htm>.

Some of these strategies include:

* Establish a culture of prevention in your organization with the following ideas
	+ Publicize a “vaccine day” in combination with education to offer influenza vaccinations
	+ Emphasize that flu vaccination protects the employees, their loved ones and those they work with
	+ Encourage employees to set an example; remind them that their action and recommendation carries a lot of weight in others’ decisions to get vaccinated
	+ Encourage employees via e-mail, posters, an employee newsletter, and any other communication tools used in your workplace to get the vaccine
	+ Track and report vaccination rates to staff and supervisors
	+ Remind unvaccinated employees with e-mail, letters, encouragement from supervisors, and telephone calls
	+ Provide contests or incentives to get vaccinated (small gift cards, raffles, pizza party, etc.)
	+ Vaccinate the medical director and all managers in front of the staff
	+ Foster team building to increase trust and cooperation
		- Team building may lead to increased compliance with organizational goals including immunization
* Educate and vaccinate staff as part of new employee orientation, training, and meetings
* Establish a process to determine and track proof of influenza vaccination each year for each employee
1. What have the studies shown for lack of efficacy of the live attenuated influenza (Nasal) vaccine [LAIV] that is recommended this year, and why was it not recommended in the past two years?

CDC and ACIP published recommendations for LAIV4 on June 8, 2018 (at <https://www.cdc.gov/mmwr/volumes/67/wr/mm6722a5.htm?s_cid=mm6722a5_w>), which stated:

““…LAIV4 demonstrated no statistically significant effectiveness against influenza A(H1N1)pdm09-like viruses among children aged 2 through 17 years in U.S. studies conducted during the 2013–14 and 2015–16 seasons (7–12), during which these viruses predominated. This lack of effectiveness was postulated as attributable to decreased replicative fitness of the influenza A(H1N1)pdm09-like viruses included in LAIV4 during those seasons (A/California/7/2009 for 2013–14 and A/Bolivia/559/2013 for 2015–16) (13). Investigations into the potential cause of this reduced effectiveness against influenza A(H1N1)pdm09 revealed that these LAIV viruses exhibited reduced replication in human nasal epithelial cells, compared with prepandemic influenza A(H1N1) LAIV viruses [prior to 2009]….

Data presented by the manufacturer in February 2018 indicated that the new LAIV4 influenza A (H1N1) pdm09-like virus, A/Slovenia/2903/2015, was shed by a higher proportion of children during days 4 through 7 following the first of 2 doses of vaccine. A/Slovenia/2903/2015 induced significantly higher antibody responses than its predecessor, A/Bolivia/559/2013. Seroconversion rates to A/Slovenia/2903/2015 were comparable to those obtained in response to prepandemic influenza A(H1N1) LAIV strains used during seasons in which the vaccine was observed to be effective against A(H1N1) influenza viruses (14)…. Shedding and immunogenicity data provided by the manufacturer suggest that the new influenza A (H1N1)pdm09-like virus included in the current LAIV4, A/Slovenia/2903/2015, has improved replicative fitness over previous LAIV4 influenza A(H1N1)pdm09-like vaccine strains.”